## CENTRAL LINE-ASSOCIATED BLOODSTREAM INFECTIONS OVERVIEW

## **BACKGROUND**

Central line associated bloodstream infections (CLABSI) are associated with specific intravascular catheters or central lines that must be in place at the time of, or within 48 hours before the onset of the infection. A central line is an intravascular catheter (tube in a vein or artery) that terminates at or close to the heart or in one of the great vessels specified by NHSN. Two examples of a great vessel are the aorta and superior vena cava. A central line can be used to infuse fluids, withdraw blood or monitor fluid volume in patients. An umbilical catheter (i.e., a tube placed in the umbilical cord) is a central vascular catheter inserted through the umbilical artery or vein in a neonate (infant  $\leq$  30 days old). Central lines can be either permanent or temporary. Permanent lines are those that are tunneled under the skin before entering a great vessel. These can include certain dialysis lines and implanted catheters such as a port. Temporary lines are those that are not tunneled.

All patients with central lines are at risk for CLABSI. However, certain groups are at higher risk for infection: elderly, neonates, dialysis patients, patients with weak immune systems (e.g., cancer patients, transplant patients), diabetics and patients with burn injuries.

Colorado requires that all adult critical care units, neonatal critical care units Level II/III and III, long term acute care hospitals (LTAC), inpatient rehabilitation units and rehabilitation hospitals report CLABSI data into NHSN.

Every CLABSI data table below lists all Colorado hospitals and hospital unit(s) reporting central line use, their cities, number of central line days per year, infection counts and rates, and comparisons to national infection rates. The number of central line days is the total number of days a central line was used in the unit during the reporting period. The CLABSI rate is the number of infections per 1,000 central line days. The three categories summarizing how a Colorado facility compares to the national infection rate for that unit are:

- 1. Statistically lower (**better**) infection rate than the national rate;
- 2. Statistically similar (same) infection rate as the national rate; or
- 3. Statistically higher (worse) infection rate than the national rate.

## NEONATAL CRITICAL CARE UNITS

Neonatal critical care units (NCCU) are classified according to levels of care. Since Level I and II units care for healthy newborns, they are not required to report HAI. Colorado requires only level III and level II/III units to report CLABSI data. Level III NCCU provide personnel and equipment to ensure continuous life support and comprehensive care for extremely high-risk newborns with complex critical conditions. The designation between Level III and Level II/III is defined by the NHSN reporting guidelines. If a hospital unit does not separate infants receiving Level II care from those receiving Level III care, that NCCU is reported as a Level II/III.

NCCU infants will often have a central line inserted for several reasons: 1) their stay in the critical care unit can be several days to months; 2) they require intravenous nutrition and fluid replacement until their gastrointestinal system has matured or they can tolerate feedings by mouth; 3) their peripheral veins (those in the arms and legs) and scalp veins are small and unable to be used for sugar solutions and medications for long periods of time; and 4) changing peripheral lines frequently can cause additional pain and stress for the infant and does not promote health. An umbilical catheter (i.e., a tube placed in the

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umbilical cord) is often inserted at birth as a means to provide nutrition while monitoring fluid balance. These catheters are a type of central line inserted through the umbilical artery or vein in a neonate (infant  $\leq$  30 days old).

## **RESULTS**

Table 20 shows the results of data collected in each NCCU from Aug. 1, 2010 through July 31, 2013.

Seventeen hospitals, including five Level III and 12 Level II/III NCCU, reported 17,842 central line days this past year. Of the 17 hospitals, 11 reported zero CLABSI and all had rates similar to national rates.

TABLE 20: Neonatal Critical Care Unit CLABSI Rates, Aug. 1, 2010 – July 31, 2013

Central Line Associated Blood Stream Infections (CLABSI) in Neonatal Critical Care Units: Aug. 1, 2010 – July 31, 2013														
Health Facility, City, NCCU Type/Level			August 2010 – July 2011				August 2011 – July 2012				August 2012 – July 2013			
			CL Days	CLABSI	CLABSI Rate	National Comparison	CL Days	CLABSI	CLABSI Rate	National Comparison	CL Days	CLABSI	CLABSI Rate	National Comparison
Centura Avista Adventist Hospital	Louisville	11/111	179	0	0	Same	128	0	0	Same	165	0	0	Same
Centura Littleton Adventist Hospital	Littleton	III	401	1	2.5	Same	265	0	0	Same	156	0	0	Same
Centura St Francis MC	Colorado Springs	11/111	1,164	0	0	Same	1,487	1	0.7	Same	1,496	1	0.7	Same
Denver Health MC	Denver	11/111	1,062	1	0.9	Same	734	1	1.4	Same	760	0	0	Same
Exempla Lutheran MC	Wheat Ridge	11/111	340	0	0	Same	380	0	0	Same	227	0	0	Same
Exempla St Joseph Hospital	Denver	11/111	1,270	1	0.8	Same	926	4	4.3	Same	585	0	0	Same
MC of Aurora	Aurora	11/111	58	0	0	Same	100	1	10	Same	75	0	0	Same
Memorial Hospital Central	Colorado Springs	III	2,610	5	1.9	Same	2,294	5	2.2	Same	1,405	2	1.4	Same
Parker Adventist Hospital	Parker	11/111	244	0	0	Same	222	0	0	Same	133	0	0	Same
Poudre Valley Hospital	Fort Collins	11/111	1,046	1	1.0	Same	1,032	1	1.0	Same	963	0	0	Same
Presbyterian St Luke's MC	Denver	III	4,201	6	1.4	Same	3,870	0	0	Better	4,434	4	0.9	Same
Rose MC	Denver	11/111	446	0	0	Same	375	0	0	Same	351	0	0	Same
Sky Ridge MC	Lone Tree	11/111	128	0	0	Same	113	0	0	Same	115	0	0	Same
St Mary's Hospital	Grand Junction	III	925	0	0	Same	745	0	0	Same	828	2	2.4	Same
Swedish MC	Englewood	11/111	399	0	0	Same	235	0	0	Same	296	0	0	Same
The Children's Hospital	Aurora	III	4,260	10	2.3	Same	4,153	6	1.4	Same	4,430	5	1.1	Same
University of Colorado Hospital	Aurora	11/111	2,578	1	0.4	Same	1,584	1	0.6	Same	672	3	4.5	Same

Facility CLABSI rates are per 1,000 central line days.

<sup>\*\*\*</sup> Indicates value not shown due to suppression of infection data, no national or historical rate available, or an expected infection count of zero.

Infections for facilities with fewer than 50 central line days per year are suppressed to protect confidential health information. These facilities fulfilled reporting requirements.

Source: National Health Care Safety Network (NHSN) Database.